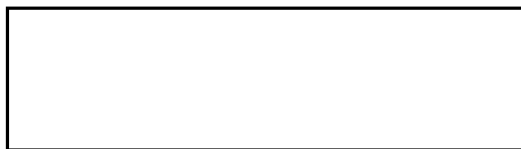


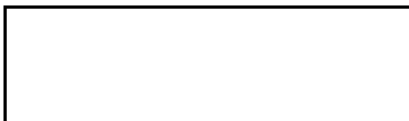
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SECOND MONTHLY NARRATIVE REPORT

15 September 1964

REFERENCE



Declass Review by NGA.

REPORTING INTERVAL

10 August 1964 - 10 September 1964

OBJECTIVE

The objective of this program is the design, construction, and testing of a prenormalizing system to be used for problems of automatic target identification on aerial imagery. The prenormalizer will scan the image and, by special filtering techniques, produce a set of measurements which have minimal change with translation and rotation of the specific image on the scene. Testing is to be accomplished on the CONFLEX I Adaptive Recognition System.

STATUS OF ACTIVITIES AND ACCOMPLISHMENTS

Introduction

In this reporting interval, the specifications of the breadboard system have been essentially completed. In addition, a small amount of computer time has been devoted to the acquisition of spectral data on the integral scan sequence. Further details are given in the following paragraphs.

Analyses

A closed expression has been derived, which describes the Fourier series representation of the integral scan sequence obtained for arbitrary distributions of signal on the image field. The process used is one of discrete convolution, requiring a great number of iterative summation processes. Attention has, for the most part, been devoted to evaluating changes in spectral composition of the signals caused by changing the number of sample slits and the position of the image on the field.

THE PRENORMALIZING SYSTEM

The Scanning System

The detailed specifications of the scanner were completed early in this interval and turned over to the mechanical design engineer. Sketches are in preparation from which the actual fabrication of the scanner can take place. An addition is being considered, which will permit generation of a sync pulse(s) at appropriate times during the rotation of the mirror. Synchronizing signals will be necessary for aligning the optical system and examining selected scan signatures. We are considering a separate perforated disc on the motor shaft which interrupts a light beam. A photo-diode and shaper circuit can then be used to generate the desired electrical sync pulses.

The Filter Bank and Interface With CONFLEX I

During this interval, a number of filter circuits have been examined. A tentative filter circuit and analog sampling gate has been breadboarded for test. At the present time, only static tests have been made on the sampling circuit. These have been successful.

TIME SPENT ON PROJECT (CUMULATIVE TOTAL)

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45 Hours

130 Hours

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TECHNICAL AGREEMENTS MADE

None

DIFFICULTIES ENCOUNTERED

None

PROGRAM FOR THE NEXT INTERVAL

Sketches of scanner parts will be passed along to the shop for fabrication in the next interval. The filter and sampling gate circuitry will be tested and proven so that a complete system can be put into fabrication. The computer simulation will be carried along to aid in the analysis of the filtering technique.

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SUBMITTED

<i>f</i>

Project Engineer

Vice President,
Engineering